AWIPS MODIFICATION NOTE 16 (for Electronics Technicians)
Maintenance, Logistics, and Acquisition Division
W/OPS12: JCS

SUBJECT : AWIPS Digital Video Broadcast (DVB) Operational Demonstration Installation Procedures

PURPOSE : To provide instructions for installation of DVB capability

EQUIPMENT AFFECTED : The new equipment will interface the current equipment at 2 points: IFL Splitter and 10/100 LAN port on the Satellite Broadcasting Network (SBN) Communications Processor (CP).

PARTS REQUIRED : DVB Field Modification Kit (FMK)

SPECIAL TOOLS REQUIRED : None

MODIFICATION PROCUREMENT : Issued by Northrop Grumman IT (NGIT)

EFFECTIVITY : See Attachment A.

ESTIMATED TIME REQUIRED : One hour

EFFECT ON OTHER INSTRUCTIONS : None. File in EHB-13, series II, section 5.1

AUTHORIZATION : The authority for this modification note is Request for Change AB551.

VERIFICATION STATEMENT : This modification was tested at the National Weather Service Headquarters and will be tested at sites listed in Attachment A.

GENERAL:

In order to enhance NWS operations, new sciences are being developed in the areas of atmospheric modeling, satellite imagery, radar processing, and interactive collaborative forecasting. The NWS currently uses a satellite broadcasting network (SBN) using T1 circuit technology to fill the demand for delivering the weather forecasting data, at the existing science level, to the field. It is expected that the demand for the new sciences in the field could increase the telecommunications requirements by more than 20 times by 2010. The current method for delivering this data to the field uses past industry standards that have become obsolete, and is inadequate for filling these demands.

The proposed solution is to replace the antiquated satellite T1 circuit technology with a scalable design that allows new science data to be delivered to the field as it becomes available, instead of having to wait for the delivery method to catch up to the delivery demand. It has been determined through engineering analysis that new Digital Video Broadcast - Satellite (DVB-S) technology will help fulfill the data delivery need of the future. It will enable the system to meet OB4 SW/DATA requirements. If fully implemented, data rates of approximately 45 MB/sec could be obtained.

Preparatory Steps

1. Receive and inventory DVB Operational Demonstration FMK. Verify received hardware against Site Receiving Report. Note any discrepancies, and immediately notify Jim Hoffman at Northrop Grumman IT (703-556-2787) of any shortages.

2. Schedule DVB installation with the NCF.

3. Contact NCF at (301) 713-9344 just prior to start of DVB equipment installation. The NCF will log into the site's AWIPS and verify that data is being properly ingested on the current AWIPS SBN data feeds. The NCF will also query the SDR-54A demodulators to collect and record key performance parameters including RSL, RBER, CSV, CMS, and Eb/No.

PROCEDURE:

A. DVB Hardware Installation Procedures

Hardware installation consists of extending the Inter-Facility Link (IFL) cabling to new Digital Video Broadcast Receivers (DVBRs), and running LAN cabling from the DVBRs to the SBN CPs. Two DVBRs are installed in the SB Rack of stand-alone sites. Four DVBRs are installed in the SB Rack at RFCs: two for the RFC; and two for the collocated WFO.

1. Open the rear door of the SB rack. (For collocated systems, install the DVB hardware in the RFC SB rack.) Tie-wrap the Line Amp (NWS5494) to the left side of the IFL Splitter's mounting panel.

2. Tie-wrap the new IFL Splitter (Splitter2) (NWS4546) to the right side of the IFL Splitter's mounting panel.

3. Ensure that the DC Block coupler is attached to the output connector of the Bandpass Filter and then place the filter assembly on the top shelf of the SB Rack.

4. Remove the terminator from the first unused output port on the original IFL Splitter (Splitter 1) and connect wire SB1BW 3-5 (8-foot Coaxial Cable, [NWS4146]) from that output port to the input port on the filter. For non-collocated sites, attach the terminator removed from Splitter 1 to Output port 4 on Splitter 2. For RFCs, place the terminator in a safe location for future use.

5. Connect wire SB1BW 3-11 (8-foot Coaxial Cable, [NWS4146]) between the DC Block coupler (attached to the output port of the filter) and the input port on the Line Amp.

6 Connect the 2-foot Coaxial Cable (SB1BW 3-6, NWS5491) from the Output port on the Line Amp to the Input port on Splitter2.

7. For non-collocated systems, place two Novra DVBRs (DVBR1-<*siteid*> and DBFR2-<*siteid*>) on the top shelf of the SB Rack. For collocated systems, place four DVBRs (DVBR1-<*rfcsiteid*>, DVBR2-<*rfcsiteid*>, DVBR1-<*wfositeid*>, and DVBR2-<*wfositeid*>) on the top shelf of the RFC's SB Rack.

8 Connect 8-foot Coaxial Cable SW1BW 3-7 (NWS4146) from Output port 1 on Splitter2 to the Satellite RF Input port on DVBR1-<*siteid*>.

9. Connect 8-foot Coaxial Cable SW1BW 3-8 (NWS4146) from Output port 2 on Splitter2 to the Satellite RF Input port of DVBR2-<*siteid*>.

10. For RFCs, connect 8-foot Coaxial Cable SW1BW 3-9 (NWS4146) from Output port 3 on Splitter2 to the Satellite RF Input port of DVBR1-<*wfositeid*>.

11. For RFCs, connect 8-foot Coaxial Cable SW1BW 3-10 (NWS4146) from Output port 4 on Splitter2 to the Satellite RF Input port of DVBR2-<*wfositeid*>.

12. Connect 10-foot LAN Cable SB1BW23 (NWS5525) from the Ethernet port of DVBR1-<*siteid*> to the 10/100 LAN port on CPSBN1.

13. Connect 10-foot LAN Cable SW1BW24 (NWS5525) from the Ethernet port of DVBR2-<*siteid*> to the 10/100 LAN port on CPSBN2.

14. For RFCs, connect 50-foot LAN Cable SW1BW25 (NWS5526) from the Ethernet port of DVBR1-<*wfositeid*> to the 10/100 LAN port on CPSBN1 of the collocated WFO.

15. For RFCs, connect 50-foot LAN Cable SW1BW269 (NWS5526) from the Ethernet port of DVBR2-<*wfositeid*> to the 10/100 LAN port on CPSBN2 of the collocated WFO.

16. Connect the power supply for DVBR1-<*siteid*> into receptacle 2 (counting from left to right) of Power Strip 1. If Power Strip 1 is a TripLite, connect the power supply into receptacle 1 on the bank of receptacles that face the front of the rack.

17. Connect the power supply for DVBR2-<*siteid*> into receptacle 2 of Power Strip 4. If Power Strip 4 is a TripLite, connect the power supply into receptacle 1 on the bank of receptacles that face the front of the rack.

18. For RFCs, connect the power supply for DVBR1-<*wfositeid*> into receptacle 4 (counting from left to right) of Power Strip 1. If Power Strip 1 is a TripLite, connect the power supply into receptacle 6 on the bank of receptacles that face the front of the rack.

19. For RFCs, connect the power supply for DVBR2-<*wfositeid*> into receptacle 4 (counting from left to right) of Power Strip 4. If Power Strip 4 is a TripLite, connect the power supply into receptacle 6 on the bank of receptacles that face the front of the rack.

B. Basic Checkout Procedure

1. After power is connected to each Novra DVBR, verify that the “Power” indicator light illuminates (steady red light). The “Signal” light should appear as a steady green light and the “Lock” light should also illuminate (steady green light).

NOTE: 1. If the AWIPS DVB channel is not active at the Master Ground Station (for example, if it is down for testing), the “Signal” light will flash intermittently and the “Lock” light will not illuminate.

2. Contact the NCF and notify them that the DVB hardware has been installed. The NCF will reverify that AWIPS data is still being properly received from the existing standard AWIPS SBN channels. The NCF will also again query the SDR-54A demodulators to collect and record RSL, RBER, CSV, CMS, and Eb/No readings.

NOTE: 2. This FMK pre-positions the hardware for the DVB operational demonstration. The data transition will occur later. Prior to the start of the operational demonstration, the NCF will configure the CP to receive the DVB NWSTG data, but to discard the DVB data rather than forward it to the acqservers on the site Preprocessors and Data Servers. For the operational demonstration, the NCF will configure the Communications Processors to ingest and distribute the DVB NWSTG data and to ingest but discard the legacy SBN NWSTG data. If a DVB failure occurs during the operational demonstration, the NCF will, via a simple software command, quickly swap the site back to the legacy SBN NWSTG data feed. The NCF will coordinate with the site before transitioning to or from the operational use of the DVB data.

REPORTING INSTRUCTIONS:

Report the completed modification using the Engineering Management Reporting System (EMRS) according to the instructions in NWS Instruction 30-2104, Maintenance Documentation, Part 4, Appendix F. Include the following information on the EMRS Report:

Block #	Block Type	Information
5	Description	Install Digital Video Broadcast (DVB) equipment
7	Equipment Code	AWIPS
8	Serial Number	001
15	Comments	Installed Digital Video Broadcast (DVB) equpiment I.A.W. AWIPS Mod Note 16.
17a	Mod. No.	16

A sample EMRS report is provided as attachment B.

Signature Not Verified

Mark S. Paese

Digitally signed by Mark S. Paese
DN: cn=Mark S. Paese, o=DOC/NOAA/NWS, c=US
Date: 2004.01.16 12:00:27 -05'00'

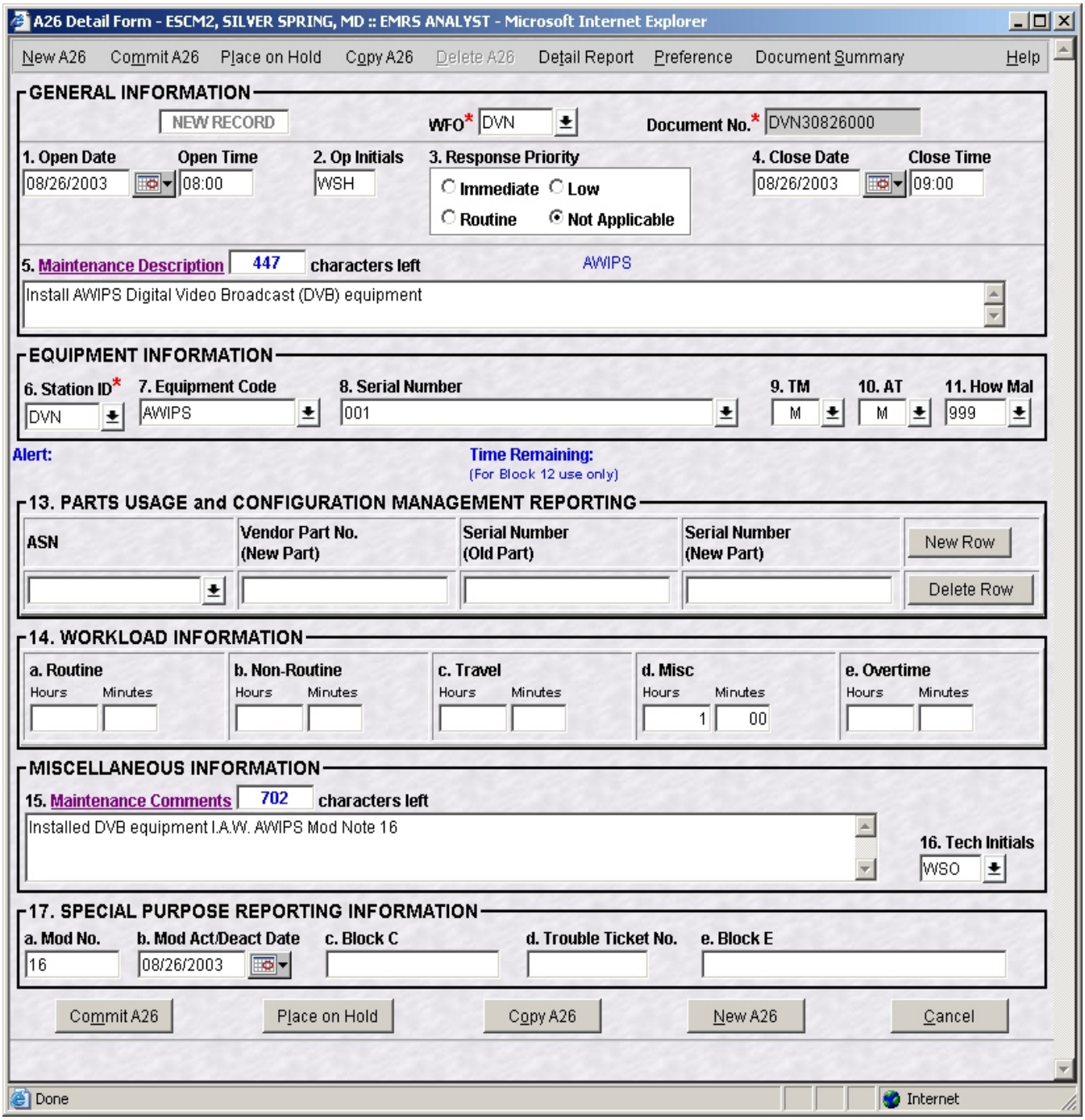
Mark S. Paese
Director, Maintenance, Logistics, and Acquisition Division

Attachment A - List of Test Sites
Attachment B - EMRS Report Sample
Attachment C - Kit Parts List

Attachment A - List of Test Sites

Site ID	Location	State
RHA/CTP	Mid-Atlantic RFC/State College WFO	PA
RNK	Roanoke WFO	VA
PHI	Philadephia WFO	PA
CAR	Caribou WFO	ME
OUN/OSFW	Norman WFO/NEXRAD OSF (ROC)	OK
DDC	Dodge City WFO	KS
BIS	Bismarck WFO	ND
DVN	Davenport WFO	IA
HNX	Hanford WFO	CA
OTX	Spokane WFO	WA
RSA/STO	Cal-Nev RFC/Sacramento WFO	CA
ORN/LIX	Lower Mississippi RFC/New Orleans WFO	LA
HUN	Huntsville WFO	AL
EYW	Key West WFO	FL
AFG	Fairbanks WFO	AK
ANCF	Network Control Facility (NCF), Silver Spring	MD
SDIF	NGIT Colshire AWIPS Lab	

Attachment B - Sample EMRS Report



Attachment C - Kit Parts List

Non-collocated sites

Part Number	Description	Qty
NWS5481	DVB RECEIVER	2
NWS4546	Cable Splitter, (Channel Master) COAX 1X4	1
NWS5494	NORSAT LINE AMPLIFIER	1
NWS5491	CBL, RG-59 COAX, 2 FT	1
NWS5490	75 OHM TERMINATOR	1
NWS5536	L-Band Filter	1
NWS5539	DC Block/Coupler	1
NWS4146	CBL, COAX, 8 FT	4
NWS5525	Cable, 10-Ft. 4-pr Assy Cat5E	2

RFC/WFO-collocated sites

Part Number	Description	Qty
NWS5481	DVB RECEIVER	4
NWS4546	Cable Splitter, (Channel Master) COAX 1X4	1
NWS5494	NORSAT LINE AMPLIFIER	1
NWS5491	CBL, RG-59 COAX, 2 FT	1
NWS5536	L-Band Filter	1
NWS5539	DC Block/Coupler	1
NWS4146	CBL, COAX, 8 FT	6
NWS5115	Cable, 10-Ft. 4-pr Assy Cat5E	2
NWS5113	Cable, 50 Ft. 10BaseT	2

SITE CODE	LOCATION
RHA/CTP	MIDDLE ATLANTIC RFC/STATE COLLEGE WFO
RNK	ROANOKE WFO
PHI	PHILADELPHIA WFO
CAR	CARIBOU WFO
OUN/OSFW	OKLAHOMA CITY WFO/NEXRAD OSF (ROC)
DDC	DODGE CITY WFO
BIS	BISMARCK WFO
DVN	QUAD CITIES (DAVENPORT) WFO
HNX	SAN JOAQUIN VALLEY (HANFORD) WFO
OTX	SPOKANE WFO
RSA/STO	CAL-NEV RFC/SACRAMENTO WFO
ORN/LIX	LOWER MISSISSIPPI RFC/NEW ORLEANS WFO
HUN	HUNTSVILLE WFO
EYW	KEY WEST WFO
AFG	FAIRBANKS WFO
ANCF	NCF/NMTW/NMTR/NHDA/NHDW/NHDR/NHOR/NHOW (SILVER SPRING)
SDIF	NORTHROP GRUMMAN IT COLSHIRE AWIPS LAB